

[From the BRITISH MEDICAL JOURNAL, June 19th, 1869]

ON

A MODE OF AFTER-TREATMENT IN OPERATIONS UPON THE URINARY ORGANS: WITH ILLUSTRATIVE CASES.

By T. R. JESSOP, F.R.C.S.,

Surgeon to the Leeds Public Dispensary; Lecturer in Physiology at the
Leeds School of Medicine

ALTHOUGH the two principal operations upon the urinary apparatus—lithotomy and perineal section—are surrounded by many difficulties and dangers, it will be readily admitted that, if it were possible to do away with the presence of urine for a sufficient length of time after the operation to allow of the wound being healed—if it were possible, that is to say, to put wounds of the urethra under like conditions with wounds in most other parts of the body—these operations would be deprived of more than half their terrors. The structures through which the surgeon cuts in the removal of a stone from the bladder, or in the division of a stricture, are not of that importance, that their entirety is necessary to the well-being of the individual; they have no vital functions to perform; they may be divided and redivided; they may be so much altered by inflammatory disease, as to be hardly recognisable, and yet be equal to the performance of their offices, in such a manner, that the rest of the system shall know nothing of their imperfections. So long as the urethral passage remains tolerably patent, it matters little what the condition of its immediate surroundings may be. Wounds of the urethral walls, and of the prostate, heal readily enough oftentimes under the most unfavourable circumstances; and in cases where the urethra has been laid open to a very considerable extent, where the prostate has been freely incised, and the tissues of the bladder itself even divided, there is every reason to believe, that union would be rapidly and safely effected, were it not for the interference by the flow of irritating urine over the cut surfaces.

To pelvic cellulitis from *urinary* infiltration, to peritonitis, derived by extension of inflammation from the prostate made to suppurate by the flow of *urine* over its cut, torn, or crushed surface, to pyæmia, induced by the absorption of pus from the recently made *urinary* fistula, the lithotomist will attribute a large proportion of his mortality. On two occasions, at least, I have found the pelvic cellular tissue in a state of suppuration, and more frequently I have known peritonitis to have been present on *post mortem* examination in cases which had undergone perineal section; occurrences which had undoubtedly been caused, either directly or indirectly, by the poisonous influence of the *urine*. It is entirely due, moreover, to the frequent escape of *urine* through the wound, that troublesome fistulous openings every now and again remain, after the urethra has been laid open. It was in the endeavour to prevent this untoward occurrence in a youth, who had previously shown a peculiar tendency to the formation of fistula, that I first adopted the plan, which it is my object in this communication to advocate.

In speaking of the treatment of urinary fistula, Sir Henry Thompson, in his Sixth Lecture, published in the *Lancet*, April 4th of last year, says: "It was sometimes attempted to cure such fistula by tying in a gum catheter for weeks or even for months; but this always fails, and for this reason, that urine always finds its way from the bladder by the side of the catheter, along the urethra, and so into the fistula, by the force of capillary attraction, and thus the object supposed to be attainable, in reality never was and never could be so accomplished. The practical surgeon soon discovers that tying in an instrument never ensures the transit of all the urine through it; some will always pass by the side and defeat your purpose."

The experience of most surgeons, I imagine, will correspond with that of Sir Henry Thompson in showing that, when a catheter is fixed in the bladder, urine does make its way by the side of the instrument; but whether this escape of urine is brought about by the force of capillary attraction may fairly be questioned. Were that so, surely there would be an incessant dropping of urine upon the bed, rather than the occasional involuntary gush, and the voluntary stream through the instrument on the withdrawal of the plug, or the turning of the stop-cock; we should expect the bladder to be kept for the most part in an almost empty condition by constant dribbling, rather than to find, as I have many times found, that there are several ounces of urine to be let off at each visit. That the sphincter at the outlet of the bladder is less powerful to retain urine when grasping a catheter, than when free to completely close the orifice it guards, the involuntary escape of the

urine at all incontrovertibly proves; but that, when in a tolerably healthy state, it will allow the urine to flow by the force of capillary attraction, I can hardly believe. The sphincter when at rest is closed, the whole urethra forms a closed canal, and it is none the less closed when it contains a catheter. Urine will pass by the side of the catheter only when forced by the contracting bladder behind, or when the bladder has become over-distended, and that too when from some independent cause the sphincter and urethral walls are paralysed. Nevertheless it cannot be denied that, where a catheter is retained in the bladder, the urine does flow more frequently, and is less under the control of the will than when the canal is throughout free to close upon itself; but this probably results from the irritation produced by the presence of the catheter in the bladder, giving rise to increased contraction of the muscular coat, rather than from the diminished resistance to further dilatation on the part of the sphincter itself. I have observed in cases of perineal section, where a plugged catheter has been retained, that, *if the plug has been withdrawn at short intervals*, the urine has flowed through and by the side of the instrument only at the time of the withdrawal of the plug, and that the bed has remained dry from one withdrawal to another. The bladder is capable, it would seem, of holding a few ounces of urine when a catheter is fixed in it, and expels its contents only after a certain amount of accumulation has taken place. If this accumulation can be prevented, there will be no forcible contraction of the bladder, and consequently no escape of urine by the side of the instrument.

CASE I.—In November 1866, I was consulted by George M., aged 21, under the following circumstances. On January 20th, 1860, he fell astride the foot-board of his bed; very extensive extravasation of urine followed, and he was removed to the Leeds General Infirmary to be under the care of the late Mr. Teale. The usual incisions were made, and the urine flowed freely through the perinæum. On the 18th of February following, as no instrument could be passed into the bladder, and the urine continued to flow through the perinæum, Mr. Teale performed perineal section, and fastened a No. 8 catheter in the bladder, which, however, had to be removed next day, in consequence of the pain it occasioned. The urethra was kept open by the occasional introduction of the bougie, as long as he remained in the hospital, and until the wound had closed. In the following June he returned to the hospital with a perineal fistula, through which almost all the urine escaped, and with the urethra impermeable to the smallest instrument. A second time perineal section was performed, and a No. 8 catheter retained in the bladder for forty-eight hours. The same instrument was

then daily passed for seven weeks, and afterwards twice a week during the few weeks he continued to attend at the hospital. When last seen there was still a small opening through which urine flowed in drops. In October, he presented himself again, in a condition very similar to that in which he had been admitted in the previous June, and again the operation was repeated, a No. 8 catheter being retained for nine days, and subsequently passed twice a week until he once more ceased to attend. Nothing further was seen of him until May 1864, when he applied at the hospital for an urinal to relieve him from the annoyance of ineontinence. He refused further treatment, although his urine was passed involuntarily for the most part through a small fistulous opening immediately behind the scrotum. When he applied to me in November 1866, the perinæum was wholly occupied by a large abscess, and there was a constant dropping of urine from the end of the urethra. He had discarded his urinal, and consequently the skin of the penis, scrotum, and insides of the thighs, as low down as the knees, was in an almost raw condition. I opened the abscess by a deep central incision, and in a few hours urine flowed freely through the wound. When the swelling had subsided, and healing had proceeded apparently to its full extent, three-fourths of the urine was passed through the fistulous opening in the perinæum, and the remainder dribbled from the end of the penis. I was unable to introduce any instrument into the bladder, even after the most persevering endeavours, and with the aid of chloroform. I therefore performed perineal section on January 29th, 1867, and fixed a No. 10 silver catheter in the bladder. The end of the catheter was closed by a plug, which was directed to be withdrawn whenever urine was passed. At each passing of urine some escaped by the wound, so that, at the end of three weeks, the edges of the now contracted wound had assumed a healed appearance, and it was evident that a permanent fistula was about to be formed. On February 20th, with the intention of preventing the accumulation of urine by the provision of a permanent drain, thereby securing a continued quiescent state of the bladder, and in the hope that the flow through the fistula would be wholly prevented, I attached an India-rubber tube, of the calibre of the catheter and two yards long, to the end of the catheter, and carried the unattached end into a vessel beneath the bed. The object was fully attained. Not a drop of urine was ever afterwards passed through the perinæum, and in little more than four weeks the wound had quite closed. For six months I occasionally passed a No. 10 bougie. He remains well at the present time.

CASE II.—In May 1867, William C., aged 6 years, was brought to

me from the country. In the previous January he had been cut for stone, and a large calculus weighing seven drachms has been extracted. For a time his symptoms disappeared, but they soon returned with increased vigour, and a fistulous opening at the inferior extremity of the cicatrix remained, from which urine was almost constantly dropping. On sounding, I readily detected the presence of more than one stone. On May 22nd, I performed lateral lithectomy, and extracted four small phosphatic coated calculi, weighing together one drachm. In the external incision I included the fistulous track. Immediately on the completion of the operation, I passed through the penis, and fixed in the bladder, a No. 6 silver catheter, with India-rubber tube attached. In the evening of the same day a wet spot, as large as a crown piece, was observed upon the sheet; but as this was partially stained with blood, and had not an urinous odour, it was probably from serum only. With this exception, if exception it could be called, *all* the urine passed through the tube. On the morning of May 25th, the tube and catheter were removed; the wound had closed except at the surface. The urine continued to flow through the urethra, and on the 26th he ran about the house quite well.

CASE III.—On March 12th, 1867, I removed a small oval calculus weighing two and a half drachms from the bladder of Mrs. M., aged 46, at Pudsey near Leeds. She had suffered from symptoms of stone for four and a half years, and during the last two years her life had been miserable in the extreme in consequence of the almost incessant straining to pass urine. The urethra was *rapidly* expanded by Weiss's dilator, to such an extent as to allow a pair of ordinary small sized lithotomy forceps to be introduced between the blades of the instrument; the stone was then seized, and was readily withdrawn. The extent of dilatation required for the extraction of the stone grasped by the forceps is represented by a circle, whose diameter measures seven-eighths of an inch. A silver female catheter, with India-rubber tube attached, was fixed in the bladder, and retained until March 18th. During the entire treatment not a single drop of urine ever escaped upon the bed, and when the catheter was removed she could retain her urine for an hour and a half. She now has perfect control over the bladder, and is quite well.

CASE IV.—In December 1867, I was called to see Mrs. B., who five days before had been delivered of her first child. Her labour had lasted many days, and finally a dead child had been extracted by instruments. For the first two days after her delivery, she had not passed any water, and since then she had suffered from violent abdominal pain.

and her bed had been constantly soaked with foetid urine. I found the bladder distended so as to reach above the umbilicus, the vagina in a putrid and sloughing state, and urine dribbling from the orifice of the urethra. A very large quantity of decomposed urine was at once drawn off through a catheter, which, with India-rubber tube attached, was fixed in the bladder. The friends were directed to syringe the vagina several times daily with warm water. The catheter was removed at the end of six days, having during the whole of that time been the means of keeping the bladder continually empty, and the bed perfectly dry. The patient ultimately recovered with no other defect than a contracted vagina.

I might cite many other cases; but these are sufficient, I think, to prove that it is quite possible, by the means I have indicated, to carry off all the urine as secreted both from the male and female bladder, without allowing any to escape by the side of the instrument; indeed, whilst I have in dozens of instances proved the fact, I have not yet met with a case in which urine escaped by the side of the catheter.

It would seem then that, if the urine be allowed to accumulate even to a slight extent, whilst a catheter is retained in the bladder, as is necessarily the case where a *plugged* catheter is made use of, the bladder will by its contraction force some of its contents out by the side of the catheter, and so defeat our object; whereas, if a continuous drain be provided, whereby the bladder can be kept constantly empty, the urethra, even when it has been freely incised, or, as in the third case narrated above, when it has been very considerably dilated, may be kept free from the contact of urine.

I need hardly dwell further upon the importance of this fact in the after-treatment of operations upon the urinary apparatus. I am sanguine enough to think that the use of the continuous drainage-tube may be the means of materially diminishing the mortality in these cases, by removing the principal barrier to union by first intention of the incisions into the urethral canal.

Before concluding, I am anxious that I shall not be understood to be putting forth a claim to have been the first to have attached an India-rubber tube to the end of a catheter, for the purpose of carrying off the urine into a vessel beneath the bed; for I am well aware that several surgeons have anticipated me in that they have made use of the tube for purposes of cleanliness and convenience, but I am not aware that it has ever before been suggested as a *principle* of treatment in lithotomy and perineal section. And yet, whilst my main object is to

show, that in the India-rubber tube we have a means at our command by which urethral wounds may be rendered comparatively simple, I would take this opportunity of strongly recommending its extended application in many of those cases, whether in the male or female, in which the frequent use of the catheter is called for, on account of the great comfort which will be thereby secured for the patient, and the valuable convenience it will prove to the surgeon. I have known a medical man travel thirty miles a day, during many consecutive days, for the purpose of passing a catheter for a female after parturition, and I have lately restored the perineum by the usual plastic operation in a patient, who, owing to the distance at which she lived, would have been compelled at great inconvenience to have left her home, had I not been able to dispense with the necessity of regular catheterism by the use of the tube.

Mr Rwing to pay \$1
